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Washington University in St. Louis
School of Medicine

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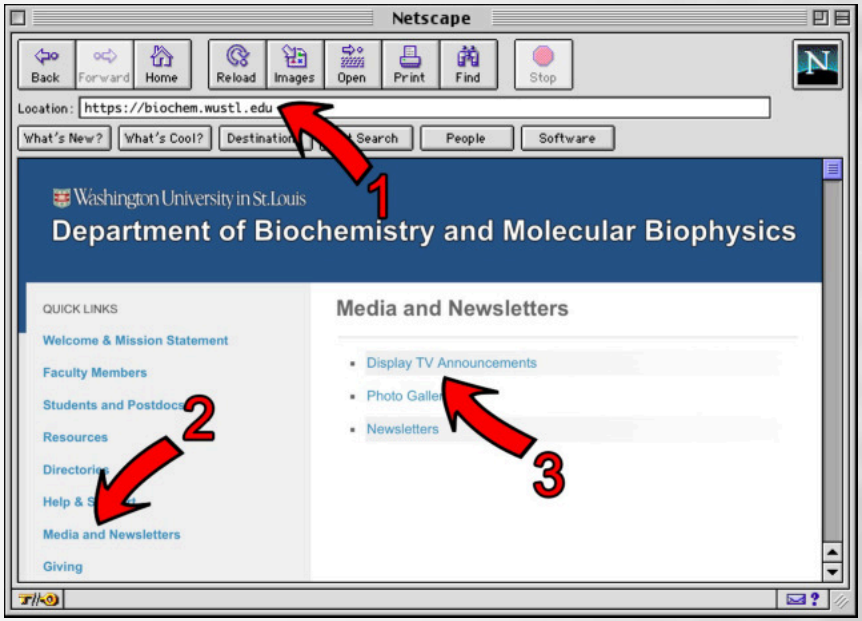
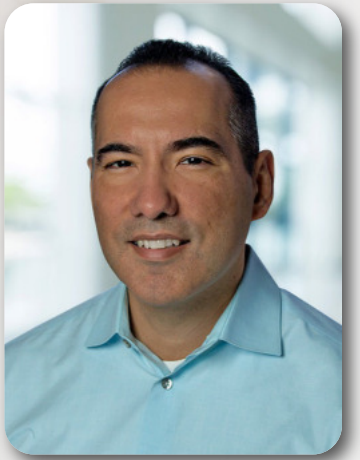


Congratulations to Dr. Garcia



August 16th, 2021 – **Benjamin Garcia, PhD**, Raymond H. Wittcoff Distinguished Professor and Head of Biochemistry and Molecular Biophysics, along with Philip A Cole, MD, PhD, Professor Biological Chemistry & Molecular Pharmacology at Harvard Medical School, received a new three year grant award from The National Science Foundation for their research entitled ***"Collaborative Research: MFB: Deciphering the Logic of PTM Crosstalk via Novel Chemical Technology: Histones and Beyond"***.

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June Publication

Mattia Bernetti, **Kathleen B. Hall**, & Giovanni Bussi

Reweighting of molecular simulations with explicit-solvent SAXS restraints elucidates ion-dependent RNA ensembles

Nucleic Acids Res. 2021 Jun 9;gkab459. doi: 10.1093/nar/gkab459. (2021)

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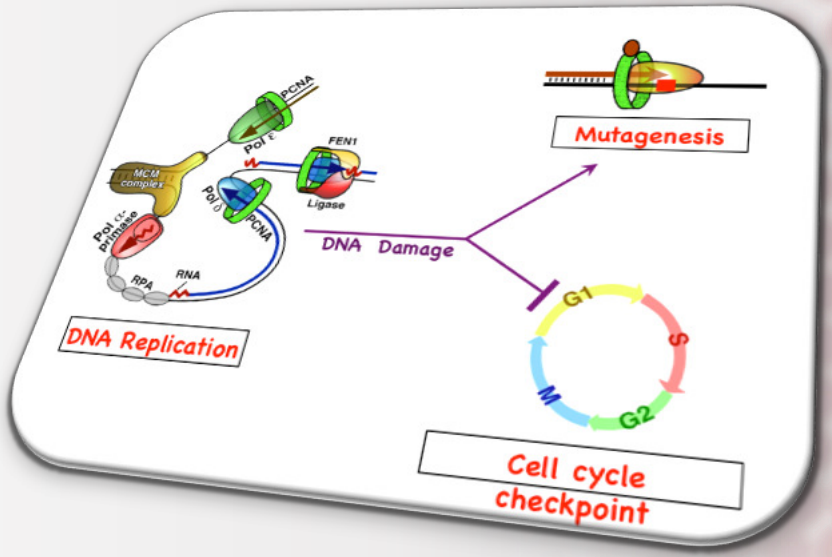
Congratulations to Dr. Holehouse

August 18th, 2021 – **Alex Holehouse, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics, along with Shahar Sukenik, Assistant Professor, Department of Chemistry & Biochemistry at University of California, Merced, and Thomas Boothby, Assistant Professor, Department of Molecular Biology, University of Wyoming, received a new four year grant award from the National Science Foundation through the new "Integrative Research in Biology" mechanism for their research entitled ***"Collaborative Research: Functional Synergy Between Disordered Proteins and their Environment in Desiccation Protection"***.

Spotlight on Research

The **Burgers Lab** studies DNA replication and DNA damage response in eukaryotic cells. Using yeast as a model organism, the lab integrates the biochemical analysis of DNA-protein interactions in purified model systems with the genetic analysis of targeted yeast mutants. Specific areas of interest are lagging strand DNA replication and Okazaki fragment maturation, damage induced mutagenesis, and DNA damage cell cycle checkpoints.

Right: DNA replication fork and Okazaki fragment maturation



See more research:
biochem.wustl.edu/spotlight

June Publication



Samantha K. Barrick, **Lina Greenberg**, & **Michael J. Greenberg**

A Troponin T Variant Linked with Pediatric Dilated Cardiomyopathy Reduces the Coupling of Thin Filament Activation to Myosin and Calcium Binding

Mol Biol Cell. 2021 Jun 23;mbcE21020082. doi: 10.1091/mbc.E21-02-0082. (2021)

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Congratulations to Matthew

August 17th, 2021 – **Matthew A Cruz, BS**, Pre-Doc Trainee in the department of Biochemistry and Molecular Biophysics, and the laboratory of Gregory Bowman, PhD, received a new three-year fellowship award from the National Institutes of Health, National Institute of Allergy and Infectious Diseases for his research entitled ***"Leveraging protein dynamics to drug filovirus protein-nucleic acid interactions using simulations and experiments"***.

COVID-19

For the latest updates on coronavirus (COVID-19), please visit here:

coronavirus.wustl.edu

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screening.wustl.edu

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Congratulations to Gregory Harrison for being selected as the 2021 Ceil M. DeGutis Prize Fellow

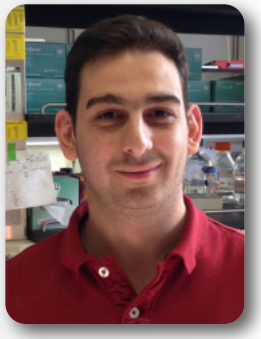
Gregory Harrison is a 5th year PhD student in the Molecular Microbiology and Microbial Pathogenesis program. His current research in the lab of Dr. Christina Stallings focuses on drug resistance and drug tolerance in the pathogen Mycobacterium tuberculosis. He grew up just outside of Chicago and moved to St. Louis to attend Washington University in St. Louis for his undergraduate degree in molecular biology.

Visit **biochem.wustl.edu/news** to read more!

Congratulations to Jhullian

August 23rd, 2021 – **Jhullian Jamille Alston, BA**, Pre-Doc Trainee in the department of Biochemistry and Molecular Biophysics, and the laboratories of Alex Holehouse, PhD and Andrea Soranno, PhD, received a Predoctoral to Postdoctoral Fellow Transition Award from the National Cancer Institute for his research entitled ***"Single Molecule Biophysics of Intrinsically Disordered Proteins in Disease"***.

June Publication



Elias A. Tannous & **Peter M. Burgers**

Novel insights into the mechanism of cell cycle kinases Mec1(ATR) and Tel1(ATM)

Crit Rev Biochem Mol Biol. 2021 Jun 20;1-14. doi: 10.1080/10409238.2021.1925218. (2021)

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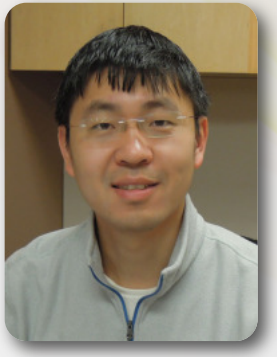

August 17th, 2021 – **Andrea Soranno, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics, **Carl Frieden, PhD**, Professor of Biochemistry and Molecular Biophysics, and **Rui Zhang, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics will collaborate in the Project named ***"ApoE isoform-specific structure: insights on biology and pathobiology"***.

The Project is part of the newly awarded five-year U19 Research Program from the National Institutes of Health, National Institute of Aging, entitled "Biology and pathobiology of apoE in aging and Alzheimer's disease", helmed by Dr. David Holtzman, Professor and Chair of the Department of Neurology at Washington University, in St Louis, and Dr. Guojun Bu, Professor of Medicine and Chair of the Department of Neuroscience, Mayo Clinic.

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May Publication




Sarah R. Clippinger, Paige E. Cloonan, Wei Wang, **Lina Greenberg**, **W. Tom Stump**, Paweorn Angsutararux, Jeanne M. Nerbonne, & **Michael J. Greenberg**

Mechanical dysfunction of the sarcomere induced by a pathogenic mutation in troponin T drives cellular adaptation

J Gen Physiol. 2021 May 3;153(5):e202012787. doi: 10.1085/jgp.202012787. (2021)

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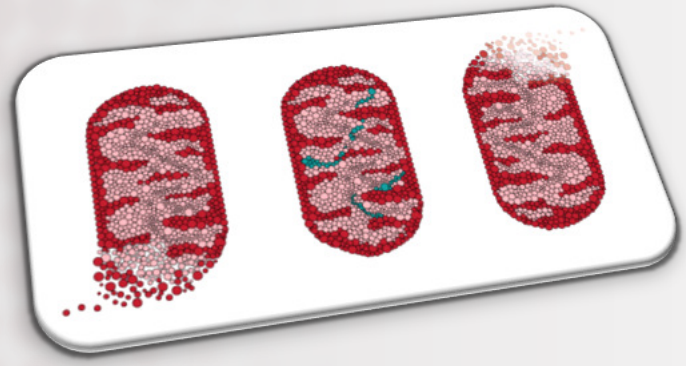
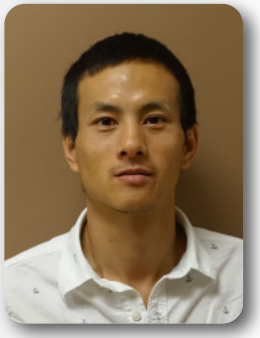
Spotlight on Research

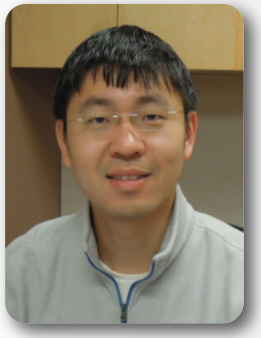


The **Niemi Lab** investigates how mitochondria are built, regulated, and maintained across physiological contexts. We blend biochemistry, systems biology, and physiology to understand mechanisms of mitochondrial regulation and how they influence metabolism and organellar function. Using insights gained from our molecular studies, we aim to understand how mitochondrial dysfunction contributes to mammalian pathophysiology, with the long-term goal of translating our discoveries into new therapeutic options to restore mitochondrial function in human disease.

See more research:
biochem.wustl.edu/spotlight

May Publication





Xiangli Wang, Yong Fu, Wandy L. Beatty, **Meisheng Ma**, Alan Brown, L. David Sibley, & **Rui Zhang**

Cryo-EM structure of cortical microtubules from human parasite Toxoplasma gondii identifies their microtubule inner proteins

Nat Commun. 2021 May 24;12(1):3065. doi: 10.1038/s41467-021-23351-1. (2021)

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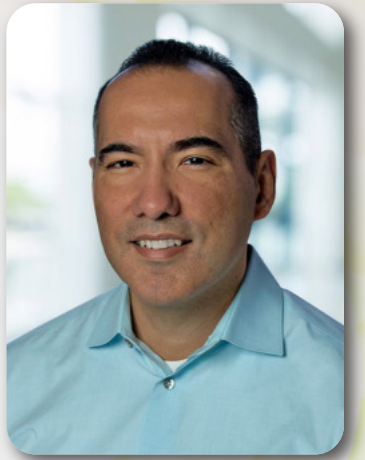
Congratulations to Dr. Garcia

August 24th, 2021 – **Benjamin Garcia, PhD**, Raymond H. Wittcoff Distinguished Professor and Head of Biochemistry and Molecular Biophysics, along with Matthew D. Weitzman, PhD, Professor of Microbiology, Professor of Pathology and Laboratory Medicine, University of Pennsylvania Perelman School of Medicine and Children's Hospital of Philadelphia, received a five year grant renewal from the National Institute of Allergy and Infectious Diseases for their research entitled ***"Viral modulation of epitranscriptomic mechanisms"***.



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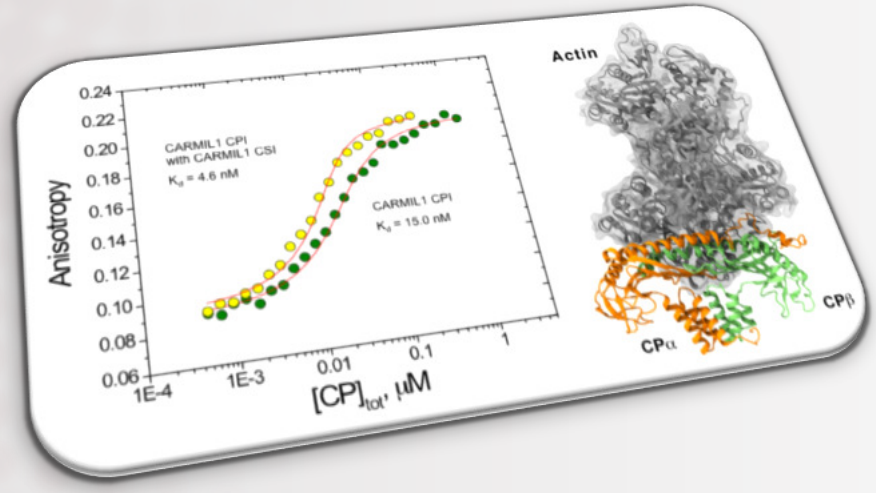
Spotlight on Research



The **Cooper Lab** is interested in how the actin filaments in cells assemble and how that assembly controls cell shape and movement. One focus is an actin-binding protein called "capping protein," which caps one end of the actin filament. Capping protein is in turn regulated by intrinsically disordered regions of the CARMIL family of proteins, which exhibit positive linkage in their binding interactions.

See more research:
biochem.wustl.edu/spotlight

Are you paid monthly?

Please remember that your time report is due by the 5th of each month.

June Publication

Melanie Ernst & **Janice L. Robertson**

The Role of the Membrane in Transporter Folding and Activity

J Mol Biol. 2021 Jun 15;167103. doi: 10.1016/j.jmb.2021.167103. (2021)

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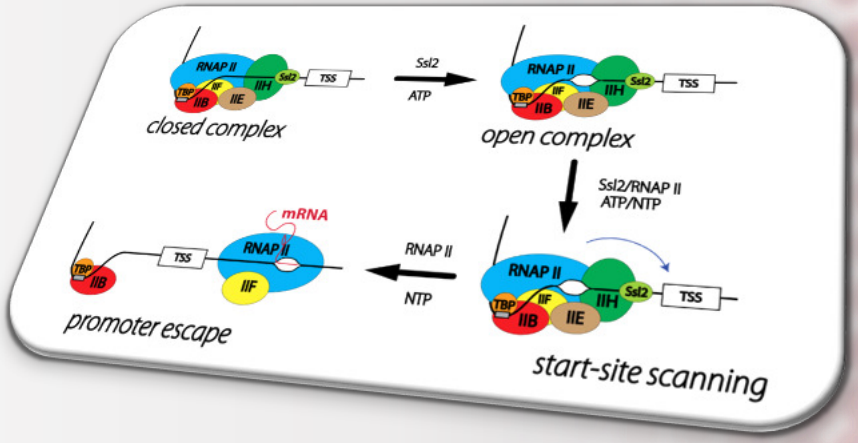
Spotlight on Research

The **Galburt Lab** strives to understand the physical mechanisms of transcription initiation and other important DNA-protein interactions. More specifically, we use a variety of single-molecule and ensemble biophysical techniques including both optical and magnetic tweezers and fluorescent microscopy to investigate how the assembly of initiation complexes on gene promoters leads to DNA unwinding and transcription. Our work is currently focused on the mechanisms of basal transcription initiation in Eukaryotes and on factor-regulated transcription in Mycobacterium tuberculosis.

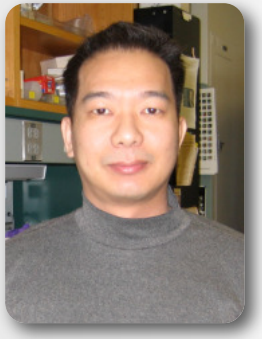


See more research:
biochem.wustl.edu/spotlight

Congratulations to Dr. Bowman

August 17th, 2021 – **Greg Bowman, PhD**, Associate Professor of Biochemistry and Molecular Biophysics, along with Guojun Bu, Professor of Medicine and chair of the Department of Neuroscience, Mayo Clinic, received a five-year U19 Research Program – Cooperative Agreement Award from the National Institutes of Health, National Institute on Aging, entitled ***"Biology and pathobiology of apoE in aging and Alzheimer's disease"***. Dr. Bowman is leader of the project's biochemical & structural biology core.

June Publication



Binh Nguyen, Min Kyung Shinn, **Elizabeth Weiland**, & **Timothy M. Lohman**

Regulation of E. coli Rep helicase activity by PriC

J Mol Biol. 2021 Jun 1;433(15):167072. doi: 10.1016/j.jmb.2021.167072. (2021)

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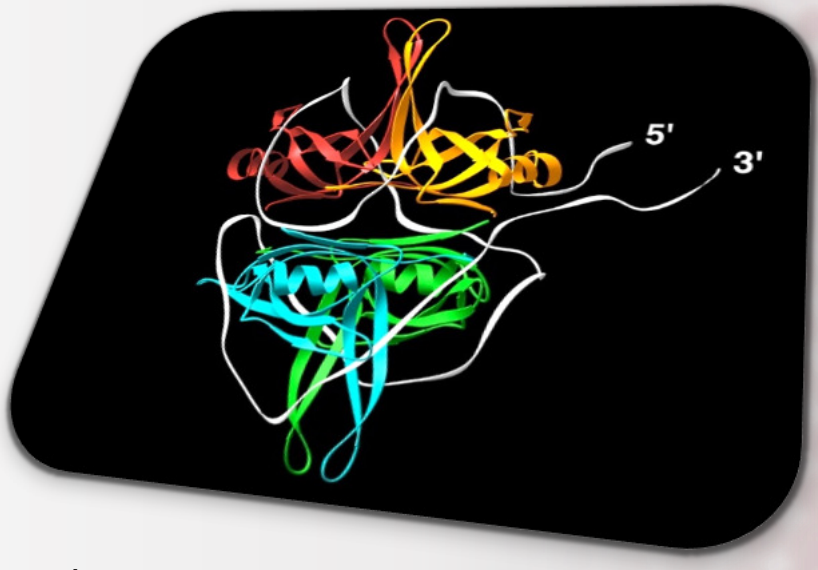
Spotlight on Research

Research in the **Lohman Lab** focuses on obtaining a molecular understanding of the mechanisms of protein-nucleic acid interactions involved in DNA metabolism, in particular, DNA motor proteins (helicases/translocases) and single stranded DNA binding proteins. Thermodynamic, kinetic, structural and single molecule approaches are used to probe these interactions at the molecular level.



See more research:
biochem.wustl.edu/spotlight

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Jessica Kennedy – Title IX Director, jwkennedy@wustl.edu, 314-935-3118

Jessica Kuchta-Miller – Staff/Postdoc/Graduate Student Ombuds, 314-379-8110

Karen O'Malley – Medical Student Ombuds, 314-660-2089

Jim Fehr – Faculty Ombuds, 314-660-2089

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June Publication

Denis A. Kiktev, Margaret Dominska, Tony Zhang, Joseph Dahl, Elena I. Stepchenkova, Piotr Mieczkowski, **Peter M. Burgers**, Scott Lujan, Adam Burkholder, Thomas A. Kunkel, & Thomas D. Petes

The fidelity of DNA replication, particularly on GC-rich templates, is reduced by defects of the Fe-S cluster in DNA polymerase δ

Nucleic Acids Res. 2021 Jun 4;49(10):5623-5636. doi: 10.1093/nar/gkab371. (2021)

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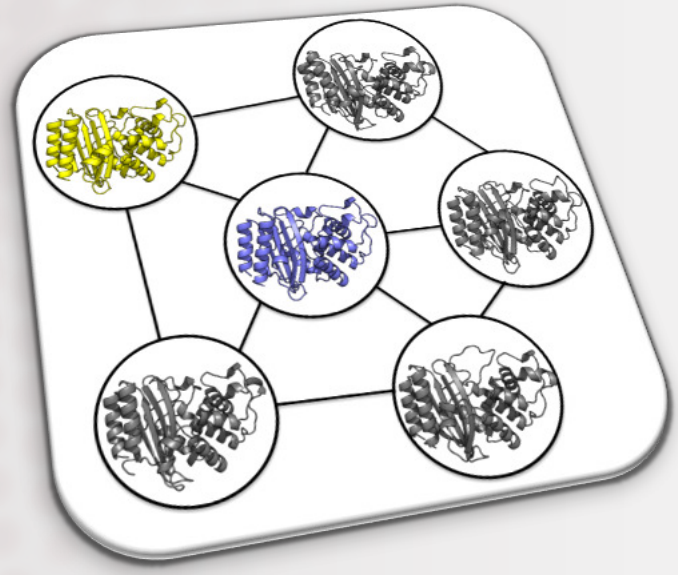
Spotlight on Research



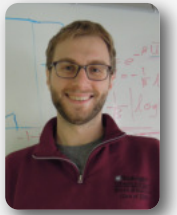
The **Bowman Lab** seeks to understand the distribution of different structures a protein adopts and how this ensemble determines a proteins function. Examples of ongoing research projects include 1) understanding how mutations in the enzyme beta-lactamase change its specificity without changing the protein's crystal structure, 2) designing allosteric drugs, and 3) developing algorithms for quickly building models of the different structures a protein adopts.

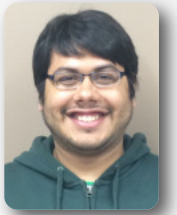
See more research:
biochem.wustl.edu/spotlight

Holiday Schedule

Holiday	Day Observed	Date Observed at WashU
Thanksgiving	**Thursday**	**November 25th, 2021**
Day after Thanksgiving	**Friday**	**November 26th, 2021**
Christmas Eve	Friday	December 24th, 2021
Christmas Day	Monday	December 27th, 2021
New Year's Eve	Friday	December 31st, 2021
New Year's Day	Monday	January 3rd, 2022

July Publication







Maxwell I. Zimmerman, **Justin R. Porter**, **Michael D. Ward**, **Sukrit Singh**, **Neha Vithani**, **Artur Meller**, **Upasana L. Mallimadugula**, **Catherine E. Kuhn**, **Jonathan H. Borowsky**, Rafal P. Wiewiora, Matthew F. D. Hurley, Aoife M. Harbison, Carl A. Fogarty, Joseph E. Coffland, Elisa Fadda, Vincent A. Voelz, John D. Chodera, & **Gregory R. Bowman**

SARS-CoV-2 simulations go exascale to predict dramatic spike opening and cryptic pockets across the proteome

Nat Chem. 2021 Jul;13(7):651-659. doi: 10.1038/s41557-021-00707-0. (2021)

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COVID-19

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coronavirus.wustl.edu

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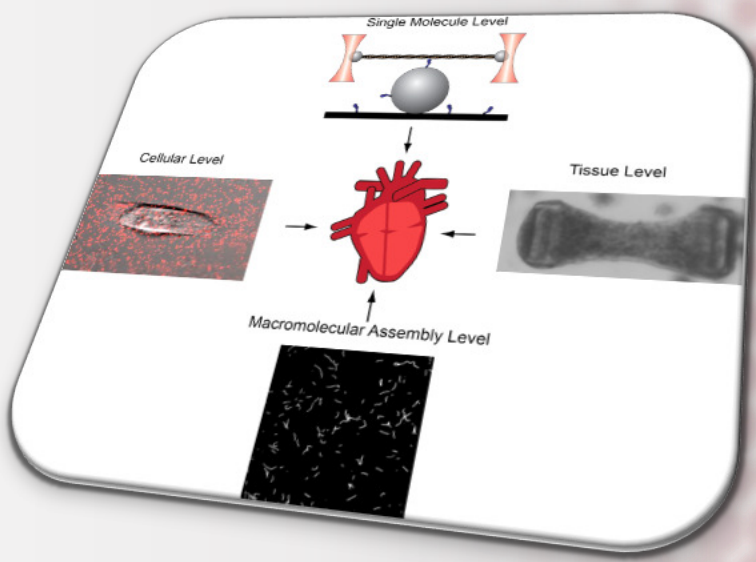
Spotlight on Research

The **Greenberg Lab** focuses on how cytoskeletal motors function in both health and disease. Currently, the lab is studying mutations that cause familial cardiomyopathies, the leading cause of sudden cardiac death in people under 30 years old. The lab uses an array of biochemical, biophysical, and cell biological techniques to decipher how these mutations affect heart contraction from the level of single molecules to the level of engineered tissues. Insights into the disease pathogenesis will guide efforts to develop novel therapies.



See more research:
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May Publication




Matthew Mahoney, **Vishnu C. Damalanka**, Michael A. Tartell, Dong Hee Chung, André Luiz Lourenco, Dustin Pwee, Anne E. Mayer Bridwell, Markus Hoffmann, **Jorine Voss**, Partha Karmakar, Nurit Azouz, Andrea M. Klingler, Paul W. Rothlauf, Cassandra E. Thompson, Melody Lee, Lidija Klampfer, Christina Stallings, Marc E. Rothenberg, Stefan Pöhlmann, Sean P. Whelan, Anthony J. O'Donoghue, Charles S. Craik, & **James W. Janetka**

A novel class of TMPRSS2 inhibitors potently block SARS-CoV-2 and MERS-CoV viral entry and protect human epithelial lung cells

bioRxiv. 2021 May 6;2021.05.06.442935. doi: 10.1101/2021.05.06.442935. (2021)

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Congratulations to Dr. Burgers

May 14th, 2021 - **Peter M. Burgers, PhD**, Marvin A. Brennecke Professor of Biological Chemistry, department of biochemistry and molecular biophysics was awarded a five-year MIRA grant renewal from the National Institute of General Medical Sciences for his research entitled ***"Mechanisms of DNA replication and maintenance in eukaryotes"***.

June Publication

George R. Heath, Ekaterina Kots, **Janice L. Robertson**, Shifra Lansky, George Khelashvili, Harel Weinstein, & Simon Scheuring

Localization atomic force microscopy

Nature. 2021 Jun;594(7863):385-390. doi: 10.1038/s41586-021-03551-x. (2021)

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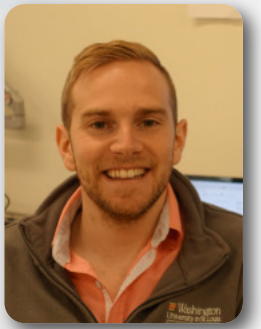
Please keep your lab locked if no one is in there when you leave.

Don’t forget your keys!

Please remember to take OFF your gloves when leaving the lab.

May Publication




Michael D. Ward, **Maxwell I. Zimmerman**, **Artur Meller**, Moses Chung, S. J. Swamidass, & **Gregory R. Bowman**

Deep learning the structural determinants of protein biochemical properties by comparing structural ensembles with DiffNets

Nat Commun. 2021 May 21;12(1):3023. doi: 10.1038/s41467-021-23246-1. (2021)

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Congratulations to Dr. Robertson

August 2nd, 2021 – **Janice L Robertson, PhD**, assistant professor of biochemistry and molecular biophysics received a four year renewal from the National Institute of General Medical Sciences for her research entitled ***"Driving forces of membrane protein assembly in membranes"***.